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Before the
Federal Communications Commission
Washington, D.C. 20554

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In the Matter of

Amendment of the Amateur Service
Rules to Provide For Greater Use of
Spread Spectrum Communication
Technologies

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WT Docket No.97-12

To: The Commission

COMMENTS OF RAPHAEL SOIFER, W2RS

Background

1. I am an Amateur Extra Class licensee and have been an active radio amateur since 1955. My amateur radio operation covers HF, VHF and UHF, including satellite, moonbounce (EME) and digital communications. I hold a B.S. degree in Electrical Engineering from Massachusetts Institute of Technology and an MBA degree from Harvard University.

Discussion

2. I generally support the intent of the Commission's proposal to liberalize the rules governing the use of Spread Spectrum (SS) in the Amateur Service. However, I respectfully request modifications to the Rules as proposed in the NPRM to minimize the potential for destructive interference to satellite and EME operation.

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3. With respect to satellite operation, I am in full agreement with the points made by the Radio Amateur Satellite Corporation (AMSAT) in paragraphs 2 and 3 of their comments. However, the rule modifications proposed by AMSAT may not go far enough in minimizing potential interference, in several specific respects:

4. Although the Commission's proposals would affect only amateur bands above 420 MHz, I understand that some commenters are proposing liberalization of SS operation in the amateur VHF bands as well. I do not support such proposals at this time, since I believe that the bands above 420 MHz provide ample spectrum for SS experimentation. Based on the results of such experiments, it may or may not turn out to be appropriate to consider broadening the frequency range in which amateur SS operations may be conducted, in a subsequent rulemaking proceeding.

5. Extension of SS operation to the 50 MHz band would, in my view, be particularly undesirable in view of the frequent ionospheric propagation at this frequency, which would make it highly probable that SS stations in the USA could cause interference to amateur and non-amateur stations in other countries.

6. However, should the Commission decide to extend amateur SS operation to the two-meter band (144 - 148 MHz) in the current proceeding, the same persuasive arguments made by AMSAT with respect to the Amateur-satellite Service bands between 435 and 2410 MHz would apply also to the international Amateur-satellite Service allocation at 144 - 146 MHz.

7. AMSAT chose to confine its comments to matters specifically affecting the Amateur-satellite Service. However, it must be noted that EME operation involves the reception of signals reflected from the moon that are typically far weaker than those from amateur satellites. Amateur EME signals as weak as -175 dBm have been detected using digital signal processing, and skilled human CW operators are able to complete two-way contacts with received signals in the range of -160 to -165 dBm. Such signals would be more susceptible to destructive interference caused by the higher apparent noise floor resulting from co-channel SS activity than are satellite signals, by several orders of magnitude.

8. The Commission wishes to foster the development of advanced technology. I can think of no better way to do this than to encourage amateur EME operation, which has already led to major innovations in the fields of antenna design, low-noise receiving amplifiers, transmitter design and radio propagation. More than a few successful high-technology companies active today have been founded by amateur EME operators.

9. Owing to the extremely weak signals involved, the vast majority of amateur EME operation today utilizes narrowband CW. Some SS proponents have argued that SS technology holds the promise of even better results. However, at the present time, these anticipated benefits exist only in theory and have not been demonstrated in practice. My proposed modifications to the Commission's proposal

would encourage the future development and testing of such technology without endangering present EME operation.

10. At present, most amateur EME operation in the 144 MHz band takes place in the band segment 144.0 - 144.1 MHz, which is restricted to CW operation under present FCC rules. Regardless of the Commission's decision with respect to SS in this proceeding, I urge that no change be made in the permitted modes of operation in this band segment.

11. In the amateur bands above 148 MHz and below 2410 MHz, EME operation most commonly takes place at 222.0-222.2, 432.0-432.2, 1296.0-1296.2 and 2304.0-2304.2 MHz. I urge that SS operation not be permitted in these band segments, except for transmissions intended to be reflected from the lunar surface.

12. In addition, I concur with the recommendations made by AMSAT with respect to the international Amateur-satellite Service allocations between 435 MHz and 2410 MHz.

Recommendations

13. My specific proposed modifications, embodying these comments, are as follows. I respectfully request that the Commission add the following language to Section 97.305:

97.305 Authorized emission types

SS (spread spectrum) emissions are authorized in the following frequency segments:

420 - 450 MHz*

902 - 928 MHz

1240 - 1300 MHz*

All Amateur frequencies above 2300 MHz*

***In the segments 435 - 438 MHz, 1260 - 1270 MHz and 2400 - 2410 MHz, SS emissions shall be used only for transmissions to or from amateur space stations, except for short tests to confirm proper operation of equipment. In the segments 432.0 - 432.2 MHz, 1296.0 - 1296.2 MHz and 2304.0 - 2304.2 MHz, SS emissions shall be used only for transmissions intended to be reflected from the lunar surface.**

14. In the event that the Commission chooses to permit SS operation in the 144 MHz and/or 222 MHz bands, I respectfully request that language be added to Section 97.305 as follows:

SS (spread spectrum) emissions are authorized in the following frequency segments:

144.1-148.0 MHz*

222.0-225.0 MHz*

***In the segment 144.1-146.0 MHz, SS emissions shall be used only for transmissions to or from amateur space stations or for transmissions intended to be reflected from the lunar surface, except for short tests to confirm proper operation of equipment. In the segment 222.0-222.2 MHz, SS emissions shall be used only for transmissions intended to be reflected from the lunar surface.**

Conclusion

15. This suggested course is consistent with the Commission's policy of fostering experimentation among the amateur community and encouraging the growth of SS, including those using it in connection with amateur satellites and EME. At the same time, it would preserve the capability of using current modes in conjunction with satellite and EME operation, even by satellite and EME users located in close proximity to other stations using SS for terrestrial applications.

RESPECTFULLY SUBMITTED,



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